Appendix C:

AIR AND RADIATION GRANT WORK PLAN TEMPLATE

Background

To assure the development and reporting of more consistent and meaningful performance information related to State grant assistance, the President's FY2007 budget request directs that EPA develop a template for use by States in submitting their grant work plans for categorical grants and Performance Partnership Grants starting in FY2007. The template requires that States provide a clear linkage of their grant-funded efforts to EPA's strategic long and short term goals and highlight relevant aspects of their annual performance and results. The template should facilitate meaningful comparison of performance across states and between a state's past and planned accomplishments.

Much of the impetus for the template can be attributed to recent assessments of several of EPA's major state (and local) grant programs conducted by the Office of Management and Budget (OMB). For air and radiation programs, OMB conducted a program assessment rating tool (PART) review of both the National Ambient Air Quality Standards program (NAAQS) for $PM_{2.5}$ and O_3 (including the state grant portion), and the Agency's Indoor Air Quality program.

OMB determined that the State/local air grant program could not demonstrate its effectiveness because it did not have performance measures that articulated short term environmental outcomes related to the grant program. While OMB's review found the Agency's Indoor Air program to be moderately effective overall, it did note that the results of the various state indoor radon grant programs needed to be more transparent. OMB's expectations are that measures developed in response to the PART are to be included in the grant template. PART review information may be viewed at: http://www.whitehouse.gov/omb/expectmore/summary.10004377.2005.html.

How is the Agency Implementing the Template Requirement?

After extensive consultation with States and other partners, EPA has chosen to implement the template by focusing on annual measures of performance related to the respective grant programs (whether through a categorical or performance partnership arrangement). To minimize any additional workload on State and local agencies, the measures selected for the template, to the fullest extent possible, are measures that are already in place or that are based on existing data systems and reporting requirements. In some cases, the measures take existing information and combine and articulate it in new ways.

For affected air and radiation programs, the template measures are a subset of, and not a replacement for the existing measures and reporting requirements still required of its partners. [1] The template is also not intended to replace the annual grant work plan that a recipient submits to EPA. The template is meant to supplement the work plan. The template is intended to help EPA and its State and local partners clarify and highlight key environmental and programmatic outcomes that are expected from the work plan and enable EPA, recipients and others look at program performance on a consistent basis.

Template Measures

In implementing the template, the focus of OAR is on the use of environmentally-related outcome measures, wherever possible (i.e., what is the impact of the State's funded activity expressed in environmental or public health terms). Also included are a limited number of existing output measures where these measures are related to supplying data that contribute to the articulation of the higher level

[1] The full suite of this information is contained in Appendix B (i.e., Annual Commitments) of OAR's FY2007 national program and grant guidance. The Guidance may be found at: http://www.epa.gov/ocfo/npmguidance.

outcome (e.g., reporting emissions and monitored air quality data, identifying the extent of radon mitigation testing).

Outdoor Air - Measures

As a result of the NAAQS PART review, OAR has developed several short term environmentally-related performance measures applicable to state, local and Tribal air grant programs.[2] In abbreviated form these are: changes in population-weighted ambient ozone and $PM_{2.5}$ concentrations, changes in the number of days in the ozone season where the ozone NAAQS is exceeded, and reductions in the number of AQI (multiple pollutant) days over a certain level in baseline non-attainment areas. Additional measures cover New Source Review permitting timeliness and reducing risk from Air Toxics. The measures are shown in the accompanying Attachment C-2.

The selected air measures do not necessitate the collection of new information on the part of EPA and its grant recipients but several do combine and relate information that is already being collected, or that is readily available, in new ways. For example, the population-weighted ozone concentration measure uses *calculated air quality design values* and *population affected in monitored counties.* More detailed information on how certain of the measures are to be calculated is provided in accompanying 'measure implementation plans' or MIPs found in Attachment C-1.[3]

Outdoor Air - Initial Roles and Responsibilities

Some measures, particularly the new NAAQS PART measures, will require that EPA first take the lead in configuring, disaggregating and establishing baseline information for FY 2007. This includes population-weighted ozone, population-weighted $PM_{2.5}$, population-weighted air quality index (AQI) values, number of ozone exceedance days, and NSR permit timeliness. Assessment of the accomplishment of these measures in FY 2007 will initially be assessed at the national level by EPA and not by State or local agencies through their work plan agreements.

It is essential, however, that in response to the template, and as part of their grant agreements, State and local agencies continue to report related output measure data to the national reporting systems that provide the underlying basis for the construction of the higher level environmental outcome measure. Specifically, reflecting the template and as part of their air grant agreements with EPA, each affected State/local agency will be the expected to operate and maintain their ozone and $PM_{2.5}$ ambient monitoring networks and submit quality-assured data into the Agency's Air Quality System pursuant to the 40 CFR 58 data reporting requirements.

Further, the existing suite of key performance expectations and commitments will need to be met to enable fulfillment and reporting on the template measures. For example, where applicable, State and local agencies will need to submit: approvable CAIR SIPs by 3/31/2007, or adopt the CAIR model trading program; approvable state implementation plans (SIPs) for attaining the 8-hour ozone standard; reasonable further progress SIPs; and maintenance SIPs for areas in attainment for ozone. State and local agencies are expected to continue development of approvable $PM_{2.5}$ SIPs which are due to EPA in April 2008.

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[2] OAR has also developed long term NAAQS measures for grants which it will report at the national level as well as performance measures for the Regional Haze program and for the Title V permit program. These are not covered in this template discussion.

[3] 'Measure Implementation Plans' (MIPs) that show how OAR is developing several of the newer grant-related performance measures for use. These plans articulate the data sources and methodology used to arrive at the measure. Certain MIPs not yet affecting recipients are still being finalized. The plans do not necessarily discuss, once EPA develops and applies the measure in the first year, how and whether responsibility for administration of the measure transitions to States, if at all, in ensuing years. This will require further consultation among EPA and its partners during FY 2007.

Indoor Air - Measures

The State Indoor Radon Program (SIRG) presents different circumstances. Four measures have been identified for the SIRG program: number of homes with mitigation systems, homes built with radon resistant construction, number of schools built or mitigated, and state-specific measures of performance that can be related to these four measures or to EPA's strategic goal of reducing premature lung cancer deaths. Due to the discretionary nature of state radon programs, a limited number of states will be able to directly report on some aspects of the 3 principle EPA measures the first year. In the 4th measure, the remaining states are asked to articulate how the outcomes of their radon programs lead to increases in one or more of the EPA measures.

Roles and Responsibilities

EPA will work with states to develop alignment between measures and to establish relevant baselines. The Agency will also work to show the relationship of reduced exposure and risk, reflected by these measures, to reduced lung cancer deaths on a state by state basis.

Those states with some type of program regulating the activities of radon service providers should be the most able to report on one of the first three measures, as many of these states require testing and mitigation data to be reported. Some other states will be able to provide less rigorous estimates of these activities, or will be able to estimate a proportion of these activities. EPA is also working with the states to improve or develop mechanisms for allocating national estimates of results to the State level.

Also, States do not directly mitigate homes or schools or build homes and schools with radon resistant new construction, but rather conduct activities to increase, promote and support mitigation and radon resistant new construction. EPA is continuing to work with the states to better characterize the relationship between the states' efforts and these outcomes.

EPA will shortly be sharing more detailed information with States on how they should be responding to the template in their State Indoor Radon grant work programs.

Conclusion

FY 2007 will be a year in which EPA and states gain experience in establishing and refining the short-term environmentally-related performance measures. For the NAAQS and air toxics areas, there are issues of data lag and data consistency that also must be clarified. This is also true, to some degree, for prospective indoor radon measures as well.

OAR will be working with State and local agencies in determining how these measures are subsequently integrated into states' and other recipients' approaches to planning and performance reporting in the out years.

Attachment C-1:

Measure Improvement Plans

NAAQS Annual Performance Measure: Ozone

Performance Measure: Percent improvement in population-weighted ambient concentrations of ozone.

Measure Description:

EPA tracks improvements in air quality on an annual basis by measuring the change in ambient air quality concentrations of 8-hour ozone in counties with monitoring data weighted by the number of people living in these counties. This measure makes use of actual, observed changes in ambient ozone levels over time to determine NAAQS program effectiveness. Three year averages of the 4th highest daily maximum ozone values (i.e., design values) are used to help mitigate the influence of meteorology which would otherwise confound measurement of actual program progress.

Measure Technical Approach:

1. The measure's baseline was established in the following manner:
    a. Calculate 8-hour ozone design values for 2001-2003 for every county with adequate monitoring data. A monitoring site's design value for 8-hour ozone is expressed as the average of the fourth-highest daily maximum 8-hour average ozone concentration for each of three consecutive years. A county's design value is the highest of these site-level design values. The national ozone monitoring network conforms to uniform criteria for monitor siting, instrumentation, and quality assurance. The network started with 1 ozone monitor in 1970 and grew to 475 monitors by 1979. In 2004, measurements of ambient ozone levels were made at 1198 monitoring sites in 716 counties across the nation.
    b. Multiply (or weight) these concentrations by the number of people living in the county where the monitor is located. The population estimates are from the U.S. Census Bureau (2000 decennial census). This population-weighted air quality concentration serves as the measure's baseline.

2. The measure's targets were established in the following manner:
    a. Project future county level design values using Clean Air Interstate Rule (CAIR) modeling results on a county basis for 2010 and 2015 and linearly interpolate for interim years of interest (i.e., 2006, 2007, and 2008).
    b. For each county, determine the difference between the baseline air quality concentrations and those projected for the future years of interest, and multiply (weight) the changes in ambient air quality concentrations by the number of people living in each county. This represents the population-weighted air quality improvement by county for the years of interest. Sum these across all counties. This is the total population-weighted air quality improvement.
    c. Express the total population-weighted air quality improvements for the year of interest as a percent change from the baseline population-weighted air quality concentration (as calculated in Step 1b).

3. To assess whether targets are met,
    a. In 2006, 2007 and 2008, calculate the design value for each county represented in the baseline, using the most recent three years of data (e.g. in 2006, use 2004-2006). A monitoring site's design value for 8-hour ozone is expressed as the average of the fourth-highest daily maximum 8-hour average ozone concentration for each of three consecutive years. A county's design value is the highest of these site-level design values. Measurements

of ambient ozone levels will be taken at 1198 monitoring sites in 716 counties across the nation

b. For each county, determine the difference between the baseline air quality concentration and the design value of interest, and multiply (weight) the change in ambient air quality concentration by the number of people living in the county. This represents the population-weighted air quality improvement by county for the years of interest. Sum these across all counties. This is the total population-weighted air quality improvement.

c. Express the total population-weighted air quality improvements for the year of interest as a percent change from the baseline population-weighted air quality concentration (as calculated in Step 1b).

It is important to note that the data necessary for assessing this performance measure will not be available until July of the summer following the milestone date of the measure. For example, the data for assessment of the measure for 2006 will not be available until Summer 2007. The data submission schedule for state and local agencies operating the ozone monitors requires certification of fully quality assured data to the national air quality data repository six months after the end of the calendar year of collection. This data must then be analyzed at the federal level. Thus, results for this measure will be reported approximately nine months after the end of the target year.

Milestones and dates (fiscal years):

FY	Target	Description
2003	0%	Baseline
2006	5%	Percent improvement in baseline population-weighted air quality by 2006
2007	6%	Percent improvement in baseline population-weighted air quality by 2007
2008	8%	Percent improvement in baseline population-weighted air quality by 2008

Measure Implementation Plans (cont).

NAAQS Annual Performance Measure: PM2.5

Performance Measure: Percent improvement in population-weighted ambient concentrations of PM2.5.

Measure Description:

EPA tracks improvements in air quality on an annual basis by measuring the change in ambient air quality concentrations of PM2.5 in counties with monitoring data weighted by the number of people living in these counties. This measure makes use of actual, observed changes in ambient PM2.5 levels over time to determine NAAQS program effectiveness. Three year averages of the annual mean PM2.5 values (i.e., design values) are used to help mitigate the influence of meteorology which would otherwise confound measurement of actual program progress.

Measure Technical Approach:

4. The measure's baseline was established in the following manner:
    a. Calculate PM2.5 design values for 2001-2003 for every county with adequate monitoring data. A monitoring site's design value for PM2.5 is expressed as the average of the annual mean PM2.5 concentrations for each of three consecutive years. A county's design value is the highest of these site-level design values. The national PM2.5 monitoring network conforms to uniform criteria for monitor siting, instrumentation, and quality assurance. The network started in 1999 with roughly 1000 monitors. In 2004, measurements of ambient PM2.5 levels were made at 1137 monitoring sites in 737 counties across the nation.
    b. Multiply (or weight) these concentrations by the number of people living in the county where the monitor is located. The population estimates are from the U.S. Census Bureau (2000 decennial census). This population-weighted air quality concentration serves as the measure's baseline.

5. The measure's targets were established in the following manner:
    a. Project future county level design values using Clean Air Interstate Rule (CAIR) modeling results on a county basis for 2010 and 2015 and linearly interpolate for interim years of interest (i.e., 2006, 2007, and 2008).
    b. For each county, determine the difference between the baseline air quality concentrations and those projected for the future years of interest, and multiply (weight) the changes in ambient air quality concentrations by the number of people living in each county. This represents the population-weighted air quality improvement by county for the years of interest. Sum these across all counties. This is the total population-weighted air quality improvement.
    c. Express the total population-weighted air quality improvements for the year of interest as a percent change from the baseline population-weighted air quality concentration (as calculated in Step 1b).

6. To assess whether targets are met:
    a. In 2006, 2007 and 2008, calculate the design value for each county represented in the baseline, using the most recent three years of data (e.g. In 2006, use 2004-06). A monitoring site's design value for PM2.5 is expressed as the average of the annual mean PM2.5 concentrations for each of three consecutive years. A county's design value is the highest of these site-level design values. Measurements of ambient PM2.5 levels will be taken at 1137 monitoring sites in 737 counties across the nation.
    b. For each county, determine the difference between the baseline air quality concentration and the design value of interest, and multiply (weight) the change in ambient air quality

concentration by the number of people living in the county. This represents the population-weighted air quality improvement by county for the years of interest. Sum these across all counties. This is the total population-weighted air quality improvement.

c. Express the total population-weighted air quality improvements for the year of interest as a percent change from the baseline population-weighted air quality concentration (as calculated in Step 1b).

It is important to note that the data necessary for assessing this performance measure will not be available until July of the summer following the milestone date of the measure. For example, the data for assessment of the measure for 2006 will not be available until Summer 2007. The data submission schedule for state and local agencies operating the PM2.5 monitors requires certification of fully quality assured data to the national air quality data repository six months after the end of the calendar year of collection. This data must then be analyzed at the federal level. Thus, results for this measure will be reported approximately nine months after the end of the target year.

Milestones and dates (fiscal years):

FY	Target	Description
2003	0%	Baseline
2006	2%	Percent improvement in baseline population-weighted air quality by 2006.
2007	3%	Percent improvement in baseline population-weighted air quality by 2007.
2008	4%	Percent improvement in baseline population-weighted air quality by 2008.

Measure Implementation Plans (cont).

New Source Review (NSR) Permit Program

Measure: Percentage of NSR[4] permits issued within one year of complete application date.

Proposed method for data collection:
EPA already collects this permit timeliness data from State and local permitting authorities, who track this data for the permit programs they administer, and enter it into a national database. EPA will query this database on an annual basis to get the data for permit issuance times.

EPA will determine the performance relative to these measures by aggregating the permit data from each permitting authority into a national data set of permit actions that occurred during the target year, together with their permit processing times measured in days. EPA will then process this data to determine the percentage of permits issued within 365 days or fewer.

Baseline and Measure

EPA established the baseline for this measure by using data from the existing national database for calendar years 2002, 2003, and 2004. We expect that these data are representative of the nation as a whole because they come from a cross section of Regions and of agency size and permit workload. These data indicate that during the three year period, the percentage processed within one year ranged from 57 to 70 percent, with a weighted average of 61%. Because we have no data to suggest that any one year is better representative of the future, the baseline should be set at 61%.

Milestones and dates (fiscal years)

FY	% of permits processed within one year.
Baseline	**61%**
2005	**61%**
2006	**61%**
2007	**61%**

[4]As used in this discussion, the term NSR is used to refer to both Prevention of Significant Deterioration (PSD) and nonattainment NSR permitting, which together are generally referred to as the NSR program.

Measure Implementation Plans (cont).

NAAQS Annual Performance Measure: AQI days

Performance Measure: Nationwide percent reduction in AQI days over 100, weighted by population and AQI value.

Measure Description:

One way to assess progress in ambient air quality concentrations is to examine the reduction in the number of days with 'unhealthy' air quality over a period of time. EPA and local officials use the Air Quality Index, or AQI, as a tool to let the public know how clean or polluted their air is and what associated health effects might be a concern. The AQI is a numerical scale ranging from 0 to 500. The higher the AQI value, the greater the level of air pollution and the greater the health concern. AQI values below 100 are generally thought of as satisfactory. When AQI values are above 100, air quality is considered to be unhealthy-at first for certain sensitive groups of people, then for everyone as AQI values get higher.

This long term performance measure for the NAAQS evaluates air quality improvement based on reductions in: (1) the number of days when the AQI is above 100; and (2) the severity of the air quality problem on those days. To accomplish this, the measure focuses only on 'unhealthy' air quality days (AQI values over 100) and counts each day using its actual AQI value on that day. For example, a code orange day with an AQI value of 101 is weighted by 1.01 whereas a code orange day with an AQI value of 149 is weighted by 1.49 and a code red day with an AQI value of 150 is weighted by 1.50. This method allows accounting for changes in the severity of the air quality levels as well as the frequency of occurrence of 'unhealthy' days.

In addition, the measure weights the days with AQI values greater than 100 by the population living in the counties in which these days occur. This means those AQI days over 100 in high-population areas will be given more weight because more people are affected. Finally, the measure uses a three-year average to account for year-to-year variability in the data and to ensure consistency with the three-year period EPA uses to assess compliance with national air quality standards.

Measure Technical Approach:

1. The measure's baseline is a three year average (2001 through 2003) of AQI days over 100, weighted by population and AQI value and is established in the following manner

   a. For each year in the base period (2001, 2002 and 2003), determine the daily AQI values by county.
   b. For days with AQI values over 100, divide the actual AQI value by 100. This essentially weights the day by its actual AQI value and results in AQI days over 100 weighted by AQI value for each county as mentioned in the measure description above.
   c. Sum these AQI days over 100 weighted by AQI value for each year by county.
   d. Multiply this sum of yearly AQI days weighted by AQI value by the county's population. The population estimates are from the U.S. Census Bureau (2000 decennial census).This results in the number of AQI days over 100 weighted by population and AQI value by county.
   e. Average the AQI days over 100 weighted by population and AQI value for each county across the three years for each county.
   f. Sum these three-year average counts of AQI days over 1000 weighted by population and AQI value across all counties to determine the national baseline.

2. The measures targets were established by:

a. For each year from 1980 to 2003 for ozone and from 1999 to 2003 for PM2.5 (i.e., the only years for which data is available for PM2.5 data) to determine the historical daily AQI values for each county.
b. For historical days with AQI values over 100 identified above, divide the actual AQI value by 100. As was done for the baseline, this essentially weights the day by its actual AQI value and results in AQI days over 100 weighted by AQI value for each county as mentioned in the measure description above.
c. Sum these historical AQI days over 100 weighted by AQI value for each year by county.
d. Multiply this sum of historical yearly AQI days weighted by AQI value by the county's population. Again, the population estimates are from the U.S. Census Bureau (2000 decennial census).This results in the number of AQI days over 100 weighted by population and AQI value by county for each year.
e. Average the historical AQI days over 100 weighted by population and AQI value for each county across every possible three year increment for each county (i.e., this historical record will include three year increments from 1980-1982 through 2001-2003).
f. Sum these historical three-year average counts of AQI days over 100 weighted by population and AQI value across all counties to establish a national historical data record for the metric.
g. Fit a statistical model (non-linear) to the historical trends in AQI days over 100 weighted by population and AQI value to project values for the years of interest 2006, 2007 and 2008
h. Express the projected number of AQI days over 100 weighted by population and AQI value for the year of interest as a percent change from the baseline number of AQI days over 100 weighted by population and AQI value (as calculated in Step 1f).

3. To assess whether targets are met:

a. In 2006, 2007 and 2008, calculate the 3 year average of the number of AQI days over 100 weighted by population and AQI value for each county represented in the baseline, using the most recent three years of data (e.g. in 2006, use 2004-2006) as is described in steps 1a through 1f above.
b. Express the improvement in the number of AQI days over 100 weighted by population and AQI value for the year of interest as a percent change from the baseline number of AQI days over 100 weighted by population and AQI value (as calculated in Step 1b).

It is important to note that the data necessary for assessing this performance measure will not be available until July of the summer following the milestone date of the measure. For example, the data for assessment of the measure for 2006 will not be available until Summer 2007. The data submission schedule for state and local agencies operating the ozone monitors requires certification of fully quality assured data to the national air quality data repository six months after the end of the calendar year of collection. This data must then be analyzed at the federal level. Thus, results for this measure will be reported approximately nine months after the end of the target year.

Milestones and dates (fiscal years):

FY	**Target**	**Description**
2003	0%	Baseline
2006	17%	Percent reduction in AQI days over 100 weighted by population and AQI value nationwide for 2006
2007	21%	Percent reduction in AQI days over 100 weighted by population and AQI value nationwide for 2007
2008	26%	Percent reduction in AQI days over 100 weighted by population and AQI value nationwide for 2008

Measure Implementation Plans (cont).

Name of program: AirToxics

Performance Measure:
Change in risk to the public

Efficiency Measure:
Change in risk to the public / Air Toxic Rulemaking Cost

Proposed method(s) for data collection:

The agency is proposing to use "toxicity-weighted" emission inventory measure as a surrogate to measure the percent change in risk to the public. The proposed measure will utilize the agencies National Emission Inventory (NEI) for air toxics along with the agencies compendium of cancer and noncancer health risk criteria to develop a risk metric that can be tabulated and tracked on an annual basis.

Details on the NEI can be found at the agencies inventory website (USEPA, 2004). Health criteria information can be found on the agencies air toxic website(USEPA 2004b).

The air toxic rulemaking costs will include the air toxics operating budget(includes, agencies resources costs, state/local/tribal grant money) as well as industries annualized costs. It important to note, that the industries annualized costs were derived from the standards RIA and EIAs at time of rule development. These costs are now being updated into a database that will be available by the end of FY04. Further it is important to realize that benefits associated with a particular rulemaking may not occur until several years after the actual rule as been developed. Thus as an efficiency measure we propose using a 3 year running average cost to better gauge costs associated with rulemaking.

Measure Technical Approach:

Obtain pollutant by pollutant (187 air toxics) values from the NEI for current year and baseline year (1990/1993).

Convert actual tons for each pollutant for baseline year to "toxicity-weighted" tons by multiplying by a unit risk estimate (URE) to determine the cancer tons and by dividing by the Reference Concentration (RfC) to get noncancer tons.

Adjust cancer and noncancer toxicity weighting factors proportionally for each HAP so that sum of each baseline inventory (actual, cancer and noncancer) are equal.

Convert actual tons for each pollutant for current year to "toxicity-weighted" tons by applying adjusted cancer and noncancer toxicity weighting factors from step3.

Sum each inventory and compare with baseline to get performance measures.

Calculate 3 year running average air toxic rulemaking cost.

Determine efficiency measure of program by dividing the inventories in step 5 by the cost in step 6.

Compare both measures on annual basis.

Milestones and dates (fiscal years) -

We plan on using the toxicity weighted risk measure through 2005. Beginning in 2006 we will supplement this measure with data from the national air toxic monitoring program.

FY	Cumulative Percent Reduction from Baseline[a]		Additional Information
	Cancer	Noncancer	
2003	23%	56%	To be measured with toxicity-weight approach (twa)
2004	22%	55%	twa
2005	22%	55%	twa
2006	22%	55%	Begin NATTS measure with twa
2207	22%	56%	NATTS w/ twa
2008	21%	56%	NATTS w/ twa
2009	20%	55%	NATTS w/twa
2010	19%	55%	NATTS w/twa

Baseline for twa is 1990/1993; baseline for NATTS monitoring is 2003
Cumulative percent reductions for 2007-1010 do not include reductions associated with the residual risk and area source standards. These reductions will be added on in future PART assessments.

Any additional information:

References:

USEPA 2004, Emissions Inventory Information;
http://www.epa.gov/ttn/chief/eiinformation.html

USEPA 2004b; Health Criteria Data for Risk Characteriation; OAQPS website at:
http://www.epa.gov/ttn/atw/toxsource/summary.html

Measure Implementation Plans (cont).

Name of program:
Air Toxics

Performance Measure:
Change in risk to the public

Efficiency Measure:
Change in risk to the public / Air Toxic Rulemaking Cost

Proposed method(s) for data collection:

he agency is proposing transitioning from the existing toxicity-weighted emission inventory measure, to a more direct measurement of predicting exposure and risk to the public. The proposed measure will utilize ambient monitoring of air toxics as a surrogate for population exposure and compare these values with health benchmarks to predict risks.

he EPA along with its state/local/tribal partners has recently started up a national air toxic monitoring network to measure ambient levels of key air toxics pollutants. Data from this ambient network is expected to be available within the next year. The network is comprised of two main components; a regional components and a local components. Modeling studies , such as the National Scale Air Toxic Assessment (NATA) (USEPA, 2002) have predicted that the air toxic risks to the public occur on two distinct geographic scales. Several air toxic pollutants have been predicted to contribute to widespread regional and/or national exposures and risks. These pollutants are called the national and regional risk drivers. Ambient levels of these pollutants at or above health benchmark levels of concern are predicted to be found in many locations. The first component of the national air toxic monitoring network, the National Air Toxic Trends Sites (NATTS) has been designed to capture the impacts of these pollutants. The second component of the national, the community scale monitoring program is being designed to capture a more local air toxic problem. Each one of these community scale projects is unique and is designed to answer a specif question as it pertains to the local issue. While this component of the network is an important contributor to the air toxic program, it will be initially difficult to use this data as a direct measure of the programs progress. Thus, it is through the NATTS component of the network that we will develop a measure of the progress of the air toxic program. Details on the NATTS can be found in the National Air Toxics Monitoring Strategy document (USEPA, 2004).

In summary the NATTS is comprised of:

22 sites (15 urban locations and 7 rural sites); comply with established physical siting protocols; provide good geographic coverage and represent different climatological regimes; include appropriate numbers of sites with influences by specific emission sources (mobile and stationary); represent regional background and transport concentrations (rural areas)

each site measures a minimum of seven priority (the national and regional drivers) pollutants (formaldehyde, arsenic, chromium, benzene, 1,3 butadiene, acrolein, light absorbing carbon).

Measurements started in Jan 2003 and January 2004

Will operate each site for a minimum of 6 years

monitor throughout the year and on the same days/ sampling schedule ;

(*e.g.* 24-hr averages every 6^{th} day)

QA/QC program to ensure sufficient data capture; and use consistent sampling, analytical methods, laboratory procedures and quality assurance protocols

Compared with modeling results of NATA neighborhood-oriented and reflective of general population exposure;

The NATTS network sites are listed in Table 1 and in Figure 1. The trends sites will be evaluated regularly to assess their effectiveness in characterizing trends and assessing concentration levels. If a given site is determined to no longer be useful for trends (or other) purposes, then it may be discontinued or relocated.

Table 1. List of NATTS Sites

Region	**Urban**	**Rural**
I	Providence RI	Chittenden, VT
	Roxbury MA	
II	New York City, NY Rochester, NY	
III	Washington DC	
IV	Atlanta GA Tampa FL	Hazard County, KY Chesterfield, SC
V	Detroit MI Northbrook IL	Mayville WI
VI	Houston TX	Harrison County, TX
VII	St. Louis MO	
VIII	Bountiful UT	Grand Junction CO
IX	San Jose Ca Phoenix, AZ	
X	Seattle WA	La Grande OR

Measure Implementation Plans (cont).

Program
Radon

Performance Measure:

Number of lives saved annually as the result of existing homes mitigated for elevated radon levels, and new homes built with radon-resistant new construction (RRNC).

Efficiency Measure:

Cost per future cancer death prevented

Methods for data collection:

EPA collects data annually on the number of new homes built with radon-resistant features based on annual surveys of homebuilding practices conducted by the National Association of Home Builders (NAHB) Research Center. EPA collects data annually on the number of existing homes mitigated for elevated radon levels based on radon mitigation fan sales data obtained through voluntary reporting by the fan manufacturers. Radon mitigation fans have an estimated life of ten years. When estimating the number of new radon mitigations annually in existing homes, the data from fan manufacturers is adjusted based on an assumption that previously-installed radon mitigation systems will have their fans replaced once every ten years.

Measure Technical Approach:

To estimate the reduced number of lung cancer deaths resulting from lowered radon exposure, EPA applies risk reduction estimates from its 2003 radon risk assessment, based on the National Academy of Sciences BEIR VI report (1,2), to the number of existing homes mitigated for elevated radon levels and the number of new homes built with RRNC. On average, for every 5,292 new homes built with radon-resistant new construction in the highest risk areas (classified as Zone 1 areas by EPA), one future life is saved annually (3). Historically, about 60% of the new homes built with RRNC in the U.S. are built in these Zone 1 areas. On average, for every 1,542 existing homes mitigated for elevated radon levels, one future life is saved annually (4). The goal of 1250 future cancer deaths prevented annually by 2012 involves tripling annual radon mitigation fan sales (which leads to almost tripling the number of homes with active radon mitigation systems) and doubling the annual number of new homes built with radon resistant new construction between 2003 and 2012.

Homeowner costs for radon mitigation systems in existing homes include, for example, the costs of installing radon mitigation equipment (typically consisting of 4-inch diameter plastic pipes with in-line tubular fans), costs for electricity to run the mitigation fans, and the cost of fan replacement every ten years. Private-sector costs for RRNC include the additional costs for builders to incorporate passive radon-resistant features into new homes. As of 2003, the EPA estimated a cost effectiveness of approximately $500,000 per future cancer death avoided, incorporating public and private sector costs and combining mitigations and RRNC. EPA has a goal to reduce the cost per future cancer death avoided to less than $400,000 by 2012.

Milestones and dates (fiscal years)

Annual reporting on radon mitigation fan sales

Annual surveys of RRNC homebuilding practices from NAHB Research Center

Targets and Dates*

	Annual additional homes with radon reducing features	Total number of homes with radon reducing features	Estimated future premature cancer deaths prevented annually	Cost per future cancer death prevented
2003	149,000	1.7 million	470	$495,000
2004	162,000	1.9 million	525	
2005	173,000	2.1 million	580	
2006	180,000	2.2 million	645	$450,000
2007	190,000	2.4 million	715	
2008	225,000	2.7 million	795	
2009	265,000	2.9 million	890	$415,000
2010	280,000	3.2 million	995	
2011	330,000	3.5 million	1110	
2012	380,000	3.9 million	1250	$390,000

* Data for the radon program is collected by calendar year. Reporting on mitigations is completed by June of the following year. Survey analysis by NAHB of new home construction is completed after one year.

References:

1. National Academy of Science, Committee on the Biological Effects of Ionizing Radiation (BEIR). Health Effects of Exposure to Radon. National Academy Press. 1999.
2. U.S. Environmental Protection Agency. EPA Assessment of Risks from Radon in Homes. June 2003 (402-R-03-003)
3. Builder Practices Report: Radon Reducing Features in New Construction 2003, Annual Builder and Consumer Practices Surveys, National Association of Home Builders Research Center, Inc., November 2004.
4. Update to Indoor Radon Cost-Benefit Analyses; 2003